Claims

1. An impurity introducing method, comprising:

a step of introducing a desired impurity into a surface of a solid base body; and

a step of radiating plasma to the surface of the solid base body after the step of introducing.

2. The impurity introducing method according to claim 1, wherein the solid base body is a semiconductor substrate, and

the step of radiating the plasma includes a step of radiating inactive plasma to the semiconductor substrate.

3. The impurity introducing method according to claim 1 or claim 2, wherein the step of radiating the plasma includes a step of radiating plasma such that the impurity possesses a desired impurity profile in the semiconductor substrate.

4. The impurity introducing method according to any one of claims 1 to 3, wherein the step of radiating the plasma includes a step of radiating plasma containing at least one kind of rare gas element.

5. The impurity introducing method according to any one of claims 1 to 4, wherein the step of radiating the plasma includes a step of radiating He plasma.

6. The impurity introducing method according to any one of

claims 1 to 3, wherein the step of radiating the plasma includes a step of radiating plasma which contains hydrogen.

7. The impurity introducing method according to any one of claims 1 to 6, wherein the step of introducing the impurity includes a plasma doping step.

8. The impurity introducing method according to any one of claims 1 to 6, wherein the step of introducing the impurity includes an ion implanting step.

9. The impurity introducing method according to any one of claims 1 to 6, wherein the step of introducing the impurity includes a gas doping step.

10. The impurity introducing apparatus, comprising:

an impurity introducing means which introduces a desired impurity into a surface of a solid base body;

an adjusting means which radiates plasma into the surface of the solid base body and adjusts the concentration distribution of the impurity in the inside of the solid base body; and an annealing means which activates the introduced impurity.

11. The impurity introducing apparatus according to claim 10, wherein an impurity introducing apparatus comprising:

a chamber;

an impurity introducing means which introduces impurity into a surface of a solid base body which is arranged in the inside of the chamber;

a plasma generating means which forms plasma on the surface of the solid base body; and

an annealing means which anneals the solid base body in the inside of the chamber.

12. The semiconductor device which is formed by using an impurity introducing method according to any one of claims 1 to claim 9, wherein

the semiconductor device is formed to have the impurity profile in which the impurity concentration at a depth position of 4nm is set to 1/10 or more of the impurity concentration on a surface of the semiconductor device.

13. The semiconductor device according to claim 12, wherein the semiconductor device is formed to have the impurity profile in which the impurity concentration at a depth position of 7nm is set to 1/100 or more of the impurity concentration on a surface of the semiconductor device.